

REMARKS

In the Office Action, the Examiner rejected claims 1-33 and objected to claims 1-4, 6, 8, 12-15, 17, 23-26 and 28. By this paper, the Applicant hereby amends claims 1-4, 6, 8, 12-15, 17, 23-33, and adds two new independent claims 34 and 35 for clarification of certain features to expedite allowance of the present application. These amendments and the new claims do not add any new matter. Upon entry of these amendments, claims 1-35 remain pending in the present application and are believed to be in condition for allowance. In view of the foregoing amendments and the following remarks, the Applicant respectfully requests reconsideration and allowance of all pending claims.

Objection to the Specification

In the Office Action, the Examiner objected to the specification due to various informalities. Although the Applicant does not necessarily agree with the Examiner's objections, the Applicant hereby amends the specification as suggested by the Examiner to expedite allowance of the present application. In view of these amendments, the Applicant respectfully requests that the Examiner withdraw the objections to the specification.

Objection to the Claims

In the Office Action, the Examiner objected to claims 1-4, 6, 8, 12-15, 17, 23-26 and 28 due to various informalities. Although the Applicant does not necessarily agree with the Examiner's objections, the Applicant hereby amends the claims as suggested by the Examiner to expedite allowance of the present application. In view of these amendments, the Applicant respectfully requests that the Examiner withdraw the objections to the claims.

Rejections Under 35 U.S.C. § 112

Claims 2-3 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant hereby amends claims 2 and 3 to recite a “data segmenting component” based on the Examiner’s comments. Accordingly, Applicant requests withdrawal of the rejections under 35 U.S.C. § 112, second paragraph.

Rejections under 35 U.S.C. § 101

In the Office Action, the Examiner rejected claims 1-33 under 35 U.S.C. § 101 as directed to non-statutory subject matter. The Applicant respectfully traverses these rejections.

Legal Precedent and Guidelines

“utility”

To satisfy the requirements under 35 U.S.C. § 101, the invention must be “useful.” In order to meet the utility requirement, a new product or process must be shown to be “operable.” That is to say, the product or process must be “capable of being used to effect the object proposed.” *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 U.S.P.Q. 805, 810-811 (Fed. Cir. 1986). An invention that is “inoperative” (i.e., it does not operate to produce the results claimed by the patent applicant) is not a “useful” invention within the meaning of the patent laws. *See, e.g., Newman v. Quigg*, 877 F.2d 1575, 1581, 11 U.S.P.Q.2d 1340, 1345 (Fed. Cir. 1989). To violate 35 U.S.C. § 101, the claimed method or device must be totally incapable of achieving a useful result. *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571, 24 U.S.P.Q.2d 1401, 1412 (Fed. Cir. 1992). Situations where an invention is found to be “inoperative” and therefore lacking in utility are rare, and rejections maintained solely on this ground by a Federal court are even rarer. M.P.E.P. § 2107.01 (II).

The Patent and Trademark Office has long applied the rule that an invention is presumed to be operable as disclosed and that the Examiner has the burden of proving inoperability. *Fregeau v. Mossinghoff*, 776 F.2d 1034, 1038, 227 U.S.P.Q. 848, 851-52 (Fed. Cir. 1985). The burden of proving operability and utility shifts to the applicant only if there is a reasonable doubt as to the truth of the applicant's assertion. That is to say, the burden of proof shifts to the applicant only if a person with ordinary skill in the art to which the invention pertains would have reasons to question the truth of the applicant's statements relative to utility. "As a matter of Patent Office practice, a specification which contains a disclosure of utility which corresponds in scope to the subject matter sought to be patented *must* be taken as sufficient to satisfy the utility requirement of § 101 for the entire claimed subject matter *unless* there is a reason for one skilled in the art to question the objective truth of the statement of utility or its scope." *In re Langer*, 503 F.2d 1380, 1391, 183 U.S.P.Q. 288 (C.C.P.A. 1974).

Accordingly, to properly reject a claimed invention under 35 U.S.C. § 101, the Office must (A) make a *prima facie* showing that the claimed invention lacks utility, and (B) provide a sufficient *evidentiary* basis for factual assumptions relied upon in establishing the *prima facie* showing. *In re Gaubert*, 524 F.2d 1222, 1224, 187 U.S.P.Q. 664, 666 (C.C.P.A. 1975) ("Accordingly, the PTO must do more than merely question operability - it must set forth factual reasons which would lead one skilled in the art to question the objective truth of the statement of operability."). If the Office cannot develop a proper *prima facie* case and provide evidentiary support for a rejection under 35 U.S.C. § 101, a rejection on this ground should not be imposed. *See, e.g., In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992) ("[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant.... If examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more the

applicant is entitled to grant of the patent."). *See also Fregeau v. Mossinghoff*, 776 F.2d 1034, 227 U.S.P.Q. 848 (Fed. Cir. 1985) (applying *prima facie* case law to 35 U.S.C. § 101); *In re Piasecki*, 745 F.2d 1468, 223 U.S.P.Q. 785 (Fed. Cir. 1984).

M.P.E.P. § 2107.01 (II) discusses a number of cases regarding the utility requirement and cautions Examiners against labeling an asserted utility as "incredible," "speculative" or otherwise, unless it is clear that a rejection based on "lack of utility" is in fact proper. *See* M.P.E.P. § 2107.01 (II), *discussing In re Sichert*, 566 F.2d 1154, 196 U.S.P.Q. 209 (C.C.P.A. 1977). Indeed, the scant case law dealing with this issue provides direction for rejecting wholly inoperative inventions with "incredible" utility. In *In re Sichert*, the Patent and Trademark Office considered the asserted utility to be inconsistent with known scientific principles or "speculation at best" as to whether attributes of the invention necessary to impart the asserted utility were actually present in the invention. *In re Sichert*, 566 F.2d 1154, 196 U.S.P.Q. 209 (C.C.P.A. 1977). To be clear, a rejection based on "speculation" is directed to challenging the asserted step as being scientifically impossible, not that the results are speculative and therefore may vary when practiced by different people. That is to say, these types of rejections are reserved for situations where the Examiner is challenging the actual ability to carry out the recited step. Repeatability is only a factor when the Applicant makes an assertion that a particular act can be performed or a particular result can be achieved, wherein the act or result would somehow seem "incredible" to one skilled in the art.

"useful, concrete, and tangible result"

According to the Supreme Court, congress intended statutory subject matter to "include anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09; 206 U.S.P.Q. 193, 197 (1980). Indeed, exclusions of statutory subject matter are limited to laws of nature, natural phenomena and abstract ideas. *See Diamond v. Diehr*, 450 U.S. 175, 185; 209 U.S.P.Q. 1, 7 (1981). Other than these specific

exceptions, therefore, nearly anything man made is statutorily patentable subject matter under 35 U.S.C. §101.

In determining when process or method claims include statutory subject matter, the Supreme Court in *Diehr* stated that “[t]ransformation and reduction of an article ‘to a different state or thing’ is the clue to the patentability of a process claim that does not include particular machines.” *See id.* 450 U.S. at 183-185, 209 U.S.P.Q. at 6. In addition to the Supreme Court’s transformation and reduction test, the Federal Circuit has developed a second test which may also be used to determine if a claim recites statutory subject matter, namely does the claim produce a “useful, concrete, and tangible result.” *In re Alappat*, 31 U.S.P.Q.2d 1545, 1557 (Fed. Cir. 1994) (*en banc*). The Federal Circuit further elaborated on this second test by holding that one must look to “the essential characteristics of the subject matter, in particular, its practical utility.” *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 U.S.P.Q.2d 1596, 1602 (Fed. Cir. 1998).

However, explaining this “useful, concrete, and tangible” test, the Federal Circuit has stated “the dispositive inquiry is whether the claim *as a whole* is directed to statutory subject matter.” *In re Alappat*, 31 U.S.P.Q.2d at 1557. Indeed, there has been no requirement from Congress, the Supreme Court, or the Federal Circuit mandating that a *specific final result* be shown for a claim to qualify under Section 101. *See id.* Rather, the Federal Circuit has specifically stated “the *Alappat* inquiry simply requires an examination of the contested claims to see if the claimed subject matter *as a whole* is a disembodied mathematical concept representing nothing more than a ‘law of nature’ or an ‘abstract idea,’ or if the mathematical concept has been reduced to *some practical application rendering it ‘useful’*.” *AT&T Corp. v. Excel Communications, Inc.*, 50 U.S.P.Q.2d 1447, 1451 (Fed. Cir. 1999) (emphasis added). Therefore, if a claim meets either the transformation and reduction test put forth by the Supreme Court, or if the

claim, read as a whole and in light of the specification, produces any useful, concrete, and tangible result, the claim meets the statutory requirements of Section 101. *See id.*

Independent claims 1, 12 and 23 recite statutory subject matter

Turning to the claims, the present independent claim 1 recites, *inter alia*, a system for building an engine baseline model for fuel-powered engines. The system includes a computer comprising a processor; a memory configured to store a program of instructions; an engine service database ...; a preprocessor for processing the engine data into a predetermined format ...; an engine baseline modeling component ...; and a display configured to display at least one aspect of the engine baseline model. Independent claim 12 recites, *inter alia*, a computer implemented method for building an engine baseline model for fuel-powered engines. The method includes storing engine data ...; processing the engine data into a predetermined format in a preprocessor ...; building an engine baseline model ...; and using the engine baseline model to monitor engine status, predict future engine behavior, diagnose engine faults, identify when engine performance is out of specification, identify engine quality, or design a new engine system, or a combination thereof. Independent claim 23 recites, *inter alia*, a computer-readable storage medium incorporating computer instructions, which when executed on a computer perform a process for building an engine baseline model for fuel-powered engines. The storage medium includes instructions for storing engine data in an engine service database ...; instructions for processing the engine data into a predetermined format in a preprocessor ...; instructions for building an engine baseline model ...; and instructions for using the engine baseline model to monitor engine status, predict future engine behavior, diagnose engine faults, identify when engine performance is out of specification, identify engine quality, or design a new engine system, or a combination thereof.

Applicant respectfully submits that amended independent claims 1, 12 and 23 are limited to particular practical applications in the technological arts. Specifically, each of the independent claims 1, 12 and 23 in its current version recites a particular practical application of building an engine baseline model for fuel-powered engines. The particular practical applications include displaying at least one aspect of the engine baseline model; using the engine baseline model to monitor engine status, predict future engine behavior, diagnose engine faults, identify when engine performance is out of specification, identify engine quality, or design a new engine system, or a combination thereof. In other words, the claimed subject matter "transforms" a tangible article, and acts on, but is not itself an abstract idea. The claimed subject matter therefore produces a useful, concrete and tangible result, based on the factors discussed above. Moreover, the description contained in the specification is full of specific examples of applications of the claimed method and system.

In view of the legal precedent and amendments presented above, the Applicant submits that the claims are in condition for allowance. Applicant therefore requests that the Examiner withdraw the rejection of claims 1, 12 and 23 and their dependent claims under 35 U.S.C. §101.

Rejections under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1-6, 8-17, 19-28 and 30-33 under 35 U.S.C. § 102(b) as anticipated by Bernier et al. (U.S. Patent No. 4,215,412, hereinafter "Bernier"). Applicant respectfully traverses these rejections.

Legal Precedent and Guidelines

First, the pending claims must be given an interpretation that is reasonable and consistent with the *specification*. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969) (emphasis added); see also *In re Morris*, 127 F.3d 1048,

1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); *see also* M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is “the primary basis for construing the claims.” *See Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. *See id.*

Second, interpretation of the claims must also be consistent with the interpretation that *one of ordinary skill in the art* would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. “The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.” *See Collegenet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 75 U.S.P.Q.2d 1733, 1738 (Fed. Cir. 2005) (quoting *Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321, 1326). The Federal Circuit has made clear that derivation of a claim term must be based on “usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art.” *See id.*

Third, anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation.

Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Fourth, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (Emphasis Added). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *Id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.* Regarding functional limitations, the Examiner must evaluate and consider the functional limitation, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. *See* M.P.E.P. § 2173.05(g); *In re Swinehart*, 169 U.S.P.Q. 226, 229 (C.C.P.A. 1971); *In re Schreiber*, 44 U.S.P.Q.2d 1429, 1432 (Fed. Cir. 1997). If the Examiner believes the functional limitation to be inherent in the cited reference, then the Examiner “must provide some evidence or scientific reasoning to establish the reasonableness of the examiner’s belief that the functional limitation is an inherent characteristic of the prior art.” *Ex parte Skinner*, 2 U.S.P.Q.2d 1788, 1789 (Bd. Pat. App. & Inter. 1986).

The cited reference is missing features recited by independent claims 1, 12 and 23.

Turning to the claims, the present independent claim 1 recites, *inter alia*, a system for building an engine baseline model for fuel-powered engines. The system includes an engine service database containing engine data for fuel-powered engines; a preprocessor

for processing the engine data into a predetermined format; an engine baseline modeling component that builds an engine baseline model for each of the plurality of groups using a regression analysis. Independent claim 12 recites, *inter alia*, a computer implemented method for building an engine baseline model for fuel-powered engines. The method includes storing engine data in an engine service database for fuel-powered engines; processing the engine data into a predetermined format in a preprocessor; building an engine baseline model for each of the plurality of groups using regression analysis. Independent claim 23 recites, *inter alia*, a computer-readable storage medium incorporating computer instructions, which when executed on a computer perform a process for building an engine baseline model for fuel-powered engines. The storage medium includes instructions for storing engine data in an engine service database for fuel-powered engines; instructions for processing the engine data into a predetermined format in a preprocessor; instructions for building an engine baseline model for each of the plurality of groups using regression analysis.

First, Bernier does not teach or suggest an engine service database containing engine data for fuel-powered engines, as generally recited by independent claim 1, 12 and 23. The Examiner refers to column 1, lines 56-60; column 1, lines 65-67 and column 5, lines 5-10 of Bernier and apparently equates “recorded engine performance data” with engine service database. The Applicant respectfully stresses that nowhere does Bernier disclose or teach any engine service database. In sharp contrast, as has been pointed out earlier in reference to column 1, lines 56-60; column 1, lines 65-67 and column 5, lines 5-10 of Bernier, “recorded engine performance data is either transmitted to the ground based monitoring station or, more typically, stored on magnetic tape or other media within the aircraft for delivery to the ground station at a later convenient time”. In fact, the Bernier reference is completely silent about any “service database”. Therefore, contrary to the Examiner’s assertion, there apparently is *no engine service database* and Bernier does not teach or suggest the foregoing features of independent claims 1, 12 and

23. In view of these deficiencies, among others, the cited reference cannot anticipate independent claims 1, 12, 23 and their dependent claims.

Second, Bernier does not teach or suggest a preprocessor for processing the engine data into a predetermined format, wherein preprocessor includes a data segmenting component that segments the engine data into a plurality of groups based upon specific types of engines and further based upon specific time periods during which each data element was measured as generally recited by independent claim 1, 12 and 23. The Examiner refers to the Abstract, lines 18-24 and column 1, lines 60-65 of Bernier and apparently equates “processing within the particular computer” with a preprocessor for processing the engine data into a predetermined format. The Applicant respectfully stresses that nowhere does Bernier disclose or teach any preprocessor for processing the engine data into a predetermined format. In sharp contrast, as has been pointed out earlier in reference to the Abstract, lines 18-24 and column 1, lines 60-65 of Bernier, “once the engine data is received at the ground station, it is generally "conditioned" by filtering techniques to remove a substantial portion of the noise content and to normalize the data so that it is amenable to processing within the particular computer and analysis routine that is employed. After such conditioning and normalization, the data is stored within a data bank for later computer processing. Generally, this processing is performed on a periodic basis to determine the temporal or trend characteristics of the monitored engine parameters, which trend information is useful in supplementing periodical overhaul policies to prevent premature removal of an engine. Additionally, when an engine fails in service, the previously recorded engine performance data can be processed within the computer to aid in determining the cause of engine failure and hence ensure that adequate overhaul procedures are followed before the engine is returned to service”. In fact, the Bernier reference is completely silent about any “preprocessor”. Therefore, contrary to the Examiner’s assertion, there apparently is *no preprocessor for processing the engine data into a predetermined format* and Bernier does not teach or suggest the

foregoing features of independent claims 1, 12 and 23. In view of these deficiencies, among others, the cited reference cannot anticipate independent claims 1, 12, 23 and their dependent claims.

Third, Bernier does not teach or suggest an engine baseline model for each of the plurality of groups using regression analysis as generally recited by independent claim 1, 12 and 23. The Examiner refers to column 6, lines 17-25; column 12, lines 19-32 and column 12, lines 47-55 of Bernier and apparently equates determination of a set of desired dependent engine parameters with an engine baseline model for each of the plurality of groups using regression analysis. The Applicant respectfully stresses that nowhere does Bernier disclose or teach any engine baseline model for each of the plurality of groups using regression analysis. In sharp contrast, as has been pointed out earlier in reference to column 6, lines 17-25; column 12, lines 19-32 and column 12, lines 47-55 of Bernier, merely “a set of independent engine parameters (x.sub.i) for estimating the values of a set of desired dependent engine parameters is determined from engine performance data of the particular type of engine to be monitored (e.g., a Pratt-Whitney JT8 or JT9 type engine, or even more generally, any high bypass, twin spool gas turbine engine), by linear regression analysis of such engine performance data”. In fact, the Bernier reference is completely silent about any “baseline model”. Therefore, contrary to the Examiner’s assertion, there apparently is *no engine baseline model for each of the plurality of groups using regression analysis* and Bernier does not teach or suggest the foregoing features of independent claims 1, 12 and 23. In view of these deficiencies, among others, the cited reference cannot anticipate independent claims 1, 12, 23 and their dependent claims.

For at least these reasons, among others, the Applicant respectfully requests withdrawal of the rejections under 35 U.S.C. § 102.

Dependent claims 8, 19 and 30.

Dependent claim 8 recites, *inter alia*, “a data acquisition component that extracts engine data from the engine services database”. Dependent claim 19 recites, *inter alia*, “processing step further comprising extracting engine data from the engine services database”. Dependent claim 30 recites, *inter alia*, “processing further comprise one or more instructions for extracting engine data from the engine services database.”

Bernier fails to teach or suggest the foregoing features of a data acquisition component that extracts engine data from the engine services database as is generally recited in dependent claims 8, 19 and 30. Bernier only discloses that once the engine data is received at the ground station, it is generally "conditioned" by filtering techniques to remove a substantial portion of the noise content and to normalize the data so that it is amenable to processing within the particular computer and analysis routine that is employed. Furthermore, after such conditioning and normalization, the data is stored within a data bank for later computer processing. Applicant has carefully reviewed the sections (column 1, lines 49-67 and column 5, lines 19-28) referenced by the Examiner and submits that these sections fail to disclose any data acquisition component or any extraction of engine data from the engine services database.

In view of the foregoing deficiencies in the teachings of the prior art, the reference cannot establish a *prima facie* case of anticipation of claims 8, 19 and 30. Accordingly, these claims are believed to be clearly patentable over the cited reference. Their reconsideration and allowance are respectfully requested.

For at least these reasons among others, the Applicant respectfully requests withdrawal of the rejections under 35 U.S.C. § 102.

Rejections Under 35 U.S.C. § 103

The Office Action summarizes claims 7, 18 and 29 as rejected under 35 U.S.C. §103(a) as being unpatentable over Bernier) in view of Gleeson et al. (U.S. Patent No. 6,317,654; hereinafter “Gleeson”). The Applicant respectfully traverses these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). In addressing obviousness determinations under 35 U.S.C. § 103, the Supreme Court in *KSR International Co. v. Teleflex Inc.*, No. 04-1350 (April 30, 2007), reaffirmed many of its precedents relating to obviousness including its holding in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). In *Graham*, the Court set out an objective analysis for applying the statutory language of §103:

Under §103, the scope and content of the prior art are to be determined, differences between the prior art and the claims at issue are to be ascertained, and the level of ordinary skill in the pertinent art are to be resolved. Against this background the obviousness or non-obviousness of the subject matter is to be determined. Such secondary considerations as commercial success, long-felt but unresolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. *KSR, slip op.* at 2 (citing *Graham*, 383 U.S. at 17-18).

In *KSR*, the Court also reaffirmed that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* at 14. In this regard, the *KSR* court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does ... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.” *Id.* at 14-15. Traditionally, to establish a *prima*

facie case of obviousness, the CCPA and the Federal Circuit have required that the prior art not only include all of the claimed elements, but also some teaching, suggestion, or motivation to combine the known elements in the same manner set forth in the claim at issue. *See, e.g., ASC Hospital Systems Inc. v. Montifiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (holding that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination.); *In re Mills*, 16 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 1990) (holding that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination). In *KSR*, the court noted that the demonstration of a teaching, suggestion, or motivation to combine provides a “helpful insight” in determining whether claimed subject matter is obvious. *KSR, slip op.* at 14. However, the court rejected a *rigid* application of the “TSM” test. *Id.* at 11. In this regard, the court stated:

The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and explicit content of issued patents. The diversity of inventive pursuit and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. *Id.* at 15.

In other words, the *KSR* court rejected a rigid application of the TSM test which requires that a teaching, suggestion or motivation to combine elements in a particular manner must be explicitly found in the cited prior art. Instead, the *KSR* court favored a more expansive view of the sources of evidence that may be considered in determining an apparent reason to combine known elements by stating:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed

by a person having ordinary skill in the art all in order to determine whether there was an apparent reason to combine in the known elements in the fashion claimed in the patent at issue. *Id.* at 14.

The *KSR* court also noted that there is not necessarily an inconsistency between the idea underlying the TSM test and the *Graham* analysis, and it further stated that the broader application of the TSM test found in certain Federal Circuit decisions appears to be consistent with *Graham*. *Id.* at 17-18 (citing *DyStar Textilfarben GmbH and Co. v. C.H. Patrick Co.*, 464 F.3d 1356, 1367 (2006) (“Our suggestion test is in actuality quite flexible and not only permits but *requires* consideration of common knowledge and common sense”); *Alza Corp. v. Mylan Labs, Inc.*, 464 F.3d 1286, 1291 (2006) (“There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires a teaching to combine ... “)).

Furthermore, the *KSR* court did not diminish the requirement for objective evidence of obviousness. *Id.* at 14 (“To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”); see also, *In re Lee*, 61 U.S.P.Q.2d 1430, 1436 (Fed. Cir. 2002) (holding that the factual inquiry whether to combine references must be thorough and searching, and that it must be based on *objective evidence of record*).

When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the

hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). The Federal Circuit has warned that the Examiner must not, “fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.” *In re Dembiczak*, F.3d 994, 999, 50 U.S.P.Q.2d 52 (Fed. Cir. 1999) (quoting *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983)).

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983); M.P.E.P. § 2145. Moreover, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959); *see* M.P.E.P. § 2143.01(VI). If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *see* M.P.E.P. § 2143.01(V).

The cited references, taken alone or in hypothetical combination, fail to teach or suggest features recited by independent claims 1, 12 and 23.

Bernier fails to teach or suggest the foregoing features of engine service database, a preprocessor and an engine baseline model as discussed in detail above in relation to the argument on the 35 U.S.C. § 102(b) rejection of independent claims 1, 12 and 23. The secondary references do not obviate the deficiencies of Bernier. The secondary

reference of Gleeson fails to obviate the deficiencies in the teachings of Bernier. Gleeson discloses a model to predict the quality of a lubricant base stock for use in a plurality of products having a plurality of viscosities. The compositional model is based on a quantitative analysis of key compositional parameters and performance criteria for the plurality of products representing the plurality of viscosities. Applicant has carefully reviewed the Gleeson reference and submits that this reference fails to disclose the claim features recited above. Instead, this reference relates to quality analysis of a lubricant base stock. For at least this reason, among others, the hypothetical combination of Bernier and Gleeson cannot support a *prima facie* case of obviousness of the present claims.

As a result, the cited references, taken alone or in hypothetical combination, fail to support a *prima facie* case of obviousness of independent claims 1, 12, and 23 and their dependent claims. For at least this reason, the Applicant respectfully requests withdrawal of the foregoing rejections.

Dependent claims 7, 18, and 29.

Dependent claim 7 recites, *inter alia*, that “the preprocessor maps engine data to an uncorrelated data set using a principal component analysis technique”. Dependent claim 18 recites, *inter alia*, “mapping engine data to an uncorrelated data set using a principal component analysis technique.” Dependent claim 29 recites, *inter alia*, “instructions for mapping engine data to an uncorrelated data set using a principal component analysis technique.”

The Examiner stated that Bernier fails to teach or suggest the foregoing feature of mapping engine data to an uncorrelated data set using a principal component analysis technique as generally recited in dependent claims 7, 18 and 29 and the Examiner relied

on the Gleeson reference for disclosure of the same features. Applicant respectfully submits that Gleeson fails to obviate the deficiencies in the teachings of Bernier as discussed in detail above in relation to the argument on the 35 U.S.C. § 103(a) rejection of independent claims 1, 12 and 23. Gleeson discloses a model to predict the quality of a lubricant base stock for use in a plurality of products having a plurality of viscosities. Applicant has carefully reviewed the Gleeson reference (column 8, lines 11-20) and submits that this reference fails to disclose mapping engine data to an uncorrelated data set using a principal component analysis technique as recited in dependent claims 7, 18 and 29. Instead, Gleeson specifically discloses that “the SIMCA method uses principal component analysis to construct a model for each class, i.e. pass/fail. Factor analysis is used to calculate the significant chemical patterns for each class. The significant patterns are known as the principal components. The principal component analysis provides a convenient method for data compression. It also provides a rotation of the data (base stock composition) to an orthonormal basis, removing any co-linearities in the data. The principal components form a new set of axes for the data (base stock properties).” Gleeson, column 8, lines 11-20. The Applicant stresses that the use of principal component analysis to construct a pass/ fail model for each class or to calculate the significant chemical patterns for each class or for any other kind of data compression is completely different from mapping engine data to an uncorrelated data set as recited in dependent claims 7, 18 and 29. For at least this reason, among others, the hypothetical combination of Bernier and Gleeson cannot support a *prima facie* case of obviousness of the present claims.

New Claims

As noted above, the Applicant hereby adds new independent claims 34-35. These claims do not add any new matter. Moreover, these new claims recite a variety of features that are missing from the cited references, taken alone or in hypothetical

combination. Accordingly, the Applicant respectfully requests allowance of the newly added claims 34-35.

Conclusion

In view of the remarks and amendments set forth above, Applicant respectfully requests allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: July 19, 2007

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